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EXAMINER
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ANGEBRANNDT, MARTIN J

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/656,503  
Filing Date: September 05, 2003  
Appellant(s): DESSAUER, ROLF

Gary P. Oakeson (44,266)  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed December 9, 2008 appealing from the Office action mailed July 21, 2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

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**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

JP 58-008357 (Trans. of record 11/30/06)	Pentel Co. LTD, Japan	02/1983
5470816	Satake et al.	11/1995
2001/0039895	Kawauchi	11/2001
4508811	Gravesteijn et al.	04/1985
2957004	Perkins et al.	10/1960
4284704	Fleming et al.	08/1981
5236884	Boggs et al.	08/1993
5362536	Fleming et al.	11/1994
WO 03/032299	Anderson et al.	04/2003
2772284 Discussed in arguments, not applied	Barnhart et al.	11/1956

Melles Griot Catalog, pp 49-4 to 49-5 (1995/1996)

RD-39219, "Infrared printout systems based upon phthalocyanine precursors", Research  
Disclosures, 3 pages, (12/1996)

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

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**A)** Claims 1, 4-10, 12-15 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over RD 39219 and JP 58-008357, in view of Kawauchi '895 and/or Satake et al. 816.

RD 39219 teaches a 1,3-diiminoisoindoline and/or related phthalocyanine precursors combined with a thermally cleavable adduct capable of generating a reducing phenolic compound when heated and a near IR absorbing dye. Suitable 1,3-diiminoisoindoline are disclosed in formula D111, which when reacted forms a metal free phthalocyanine. If desired the corresponding metallized phthalocyanine can be produced by the inclusion of a metal salt, such as copper acetate. The reaction to form the phthalocyanine is more efficient in the presence of a reducing agent. The use of an adduct which releases hydroquinone upon heating to 150 degrees C is disclosed (page 2). The use of a dye as NIR absorber is disclosed. The addition of binders, thermal stabilizers, UV stabilizers, surfactants or the like is disclosed. (page 2).

JP 58-008357 in example 1 uses 1-amino-3-iminoisoindolene, Cu-hydroxyethylsarcosine, hydroquinone and polyvinyl butyral, which when heated to 120 degrees C forms a blue Cu phthalocyanine (col. 5). Example 2 uses acetic acid as the reducing agent and ethyl cellulose as the binder and a cobalt monoethanol amine complex as the metal source and changes color at 150 degrees C (col 5-6). Example 3 uses a Ni glycine salt as the metal source, urea, benzophenone and polyvinyl alcohol and changes color at 150 degrees C (col 6). The compositions disclosed all are thermographic and change color when heated at 100-150 degrees C (col 3).

Kawauchi '895 describes the use of light to heat conversion means using infrared absorbing dyes, such as benzo(thio)pyrylium methine, naphthoquinone, squarilium,

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dihydropyrimidine, pyrilium, cyanine in amounts of 0.5 to 15%. [0087-0090]. These are used in forming printing plates. Notes dye 2, which is the dyes recited in claims 21.

Satake et al. 816 teach photothermorecording media, where the IR laser is used as a recording light source. Useful light absorbers are polymethine, cyanine, squarylium, metal complexes, chroconium, metal dithiol complexes, pyrilium, naphtho**quinone** dyes and the like (55/54-56/23). These are described as used with dye precursors and their developers. The use of various binders including is disclosed (54/11-33). The addition of the IR absorber allow the thermal recording sheet to be recorded optically. (55/41-46). The use of a thermal printer (60/34-35) or a laser plotter with a 30 mW 830 nm laser (48-56) is disclosed, The diffraction limited spot size for an 830 nm laser is  $\sim 0.83$  microns/0.45 which yields 1.8 microns. The absorber is added in an amount of 4% in example 71, which generates a color.

It would have been obvious to one skilled in the art to modify the teachings of RD 39219 by using other metal sources, such as Cu- hydroxyethylsarcosine, known to react with iminoisoindolines to form metallized phthalocyanine as evidenced by JP 58-008357, in place of those disclosed by RD 39219 with a reasonable expectation of forming a useful photothermographic recording material and to use  $\sim 4\%$  of the IR absorber based upon the direction in Kawauchi '895 to amounts of 0.5-15% or the 4% of the IR absorber by Satake et al. '816 as neither of RD 39219 and JP 58-008357 teach an amount. Further it would have been obvious to use the other reducing agents, such as hydroquinone or ascorbic acid, and the binders, such as ethyl cellulose, disclosed by JP 58-008357 in the medium in place of those exemplified by RD 39219 with a reasonable expectation of forming a functional photothermographic recording medium which colors at temperatures of less than 150 degrees. Further, it would have

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been obvious to use other known IR absorbing dyes, as light to heat conversion means in place of the squarylium dye disclosed by RD 39219 with a reasonable expectation of forming a useful photothermographic medium based upon the disclosure of equivalence of the IR absorbers disclosed by Kawauchi '895 and/or Satake et al. 816.

The added language describes the sensitivity of the composition. The prior art (in the cited text) and the instant application in the prepub at [0042] all discuss the use of compositions where the IR absorber is present in amounts of ~4 %. This amount, which is rendered obvious by the prior art, is held to inherently sensitize the composition within the bounds of the claims. The language added to the claims merely describes the sensitivity of the medium as these claims are not direct to the method of use or the apparatus, therefore the applicant's arguments that the specific laser, laser power and spot size needs to be taught in the references is incorrect.

With respect to claims 39-41 these claims are to the medium, not the system and so does not serve to distinguish over the prior art for the reasons above.

**The RD 39219 and JP 58-008357 are both relied upon and are not used in the alternative. These references are very evenly matched in terms of which is the best, hence the wording of the rejection. The examiner notes that the precursors relied upon from US 2,772,284 (see prepub at [0034]) are disclosed as being converted to the phthalocyanine by heating at 200 degrees for fifteen minutes (4/38-45 of 2772284). , while that of the prior art applied undergoes phthalocyanine dyes formation at 100-150 degrees as so would be expected to undergo the reaction under the influence of laser induced heating under the recited conditions, indeed they might be more sensitive than the disclosed composition. The examiner notes that the amount of heat discussed as applied by the thermal head is**

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**200-300 degrees C (50/42), and color is not developed at 150 degrees C (50/40) and so to cause color formation the effect of the laser heating would have to be the same as that of the thermal head. Therefore the position of the examiner regarding the amount of heating caused by the lasers irradiation is sound, noting that the compositions of RD 39219 and JP 58-008357 become colored at 100-150 degrees C.**

The applicant argues that the compositions of the instant specification become colored at 150 degree C. This is not recited in the claims and so carries no weight. Further, the applicant fails to appreciate that the claims seek coverage for embodiments broader than those of the examples and so the argument is not commensurate with the scope of coverage sought. The applicant's arguments also fail to appreciate that the amount of IR absorber also plays a part in the heating. The ranges in the instant specification are 0.1 to 10 wt %. (the examples uses almost 10%). 4% is exemplified by Satake et al. 816 and the range 0.5 to 15% is taught by Kawauchi '895. Therefore there is a reasonable expectation that the addition of the IR absorbers in the ranges recited in the Kawauchi '895 and/or Satake et al. 816 would heat the composition to a temperature sufficient to color them. If the applicant can show that the inventive compositions color at unexpectedly lower temperatures in declaration evidence and amends the claims to be commensurate with the showing (ie take the inventive composition and heat it with a calibrated thermal head, rather than using light) this could be considered as address then the issue of sensitivity, which the applicant seems to be advancing as the benefit. The examiner notes that the Perkins et al. '004 and Fleming et al. '704 show similar temperatures for the color formation to the 150 degrees C of RD 39219 and JP 58-008357. The applicant's argument also fails to appreciate the direction to an IR dye in RD 39219. The US 2772284 was cited by the applicant



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and is identified on page 10 of the instant specification. The examiner points to it (through the instant specification or the prepub thereof) to establish that the argued position is not congruent with the facts of the applicant's own specification. It would appear from the facts in the file that the inventive composition is less sensitive than those of the prior art, but perhaps this is due to the lack of a reducing agent in the example composition or that of US 2772284. The rejection stands.

**B)** Claims 1,4-10,12-15,17,20-22,24,25 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over RD 39219 and JP 58-008357, in view of Fleming et al. '536 and Anderson et al. WO 03/032299.

Fleming et al. '536 teach an optical recording medium comprising a writable CD. The substrates may be grooved (3/44-67). The recording layer includes a leuco dyes, which can be thermally reacted to form a dye (4/49-59). The sensitizing dye is one, which absorbs at the desired wavelength and is present in the amount of more than 5% (4/39-46). The addition of a thermal acid generator is disclosed. (16/32+). The exposure uses a 708 nm laser which has a power of 4-16 mW and the duration of the exposure of a point by the 3.56 micron the laser spot when the medium is rotated at 2.8 m/s is 1.2 microseconds.

Anderson et al. WO 03/032299 teach the writing of label data on the topside of and optical disk with respect to figure 3. The use of photothermal recording layers comprising leuco dyes which are reduced under the influence of heat provided by IR light sources (6/29-12/11). Useful near IR absorbers are disclosed and include cyanine dyes and the like (12/12-17/17).

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It would have been obvious to one skilled in the art to modify the teachings of RD 39219 by using other metal sources, such as Cu- hydroxyethylsarcosine, known to react with iminoisoindolines to form metallized phthalocyanine as evidenced by JP 58-008357, in place of those disclosed by RD 39219 with a reasonable expectation of forming a useful photothermographic recording material and to use ~ 5% of the IR absorber based upon the direction in Fleming et al. '536 as neither of RD 39219 and JP 58-008357 teach an amount. Further it would have been obvious to use the other reducing agents, such as hydroquinone or ascorbic acid, and the binders, such as ethyl cellulose, disclosed by JP 58-008357 in the medium in place of those exemplified by RD 39219 with a reasonable expectation of forming a functional photothermographic recording medium which colors at temperatures of less than 150 degrees and to apply this composition to an optical disk substrate as is taught by each of Fleming et al. '536 and Anderson et al. WO 03/032299 with a reasonable expectation of the resulting layer being useful for recording digital data as taught by Fleming et al. '536 or providing a means for labeling the CDs as taught by Anderson et al. WO 03/032299 based upon these references establishing the use of leuco dyes based compositions as either a recording layer or as a label forming layer.

The rejection stands for the reasons above and the examiner notes that the laser may be used to record information on the label (ie in the recited composition) or in a different recording layer. Not until the method claims are prosecuted can the two be tied together.

The rejection based upon Anderson et al. '708 has been withdrawn based upon the common assignation. Both Fleming et al. '536 and Anderson et al. WO 03/032299 teach leuco

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dye compositions in optical recording disks. The claims do not recite a separate recording layer from the leuco dye recited and so reading the claims to limit a label for all the disk embodiments.

Fleming et al. '536 teaches less than 5% of the IR absorber. The rejection stands.

**C)** Claims 1,4-15,17,20-25 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over RD 39219 and JP 58-008357, in view of Fleming et al. '536 and Anderson et al. WO 03/032299, in view of Boggs et al. '884.

Boggs et al. '884 teaches a leuco dye coloring composition in response to heat (see example 1). The use of IR absorbers of more than 700 nm, particularly 850 nm. (20/65-21/33). Useful binders, including cellulose acetate butyrate, polymethyl methacrylate and polyvinyl butyral are disclosed (22/43-59).

To address other embodiments bounded by the claims, but not rendered obvious above, the examiner cites Boggs et al. '884 and holds that it would have been obvious to modify media rendered obvious by the combination of RD 39219, JP 58-008357, Fleming et al. '536 and Anderson et al. WO 03/032299 by using other binders known to be useful in leuco dye coloring compositions, such as cellulose acetate butyrate, polymethyl methacrylate or polyvinyl butyral taught by Boggs et al. '884 with a reasonable expectation of forming a useful/functional leuco dyes composition.

The rejection stands for the reasons above as no further arguments were directed at this line of rejection.

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**D)** Claims 1-10,12-22,24,25 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over RD 39219 and JP 58-008357, combined with Fleming et al. '536 and Anderson et al. WO 03/032299, in view of either Perkins et al. '004 or Fleming et al. '704.

Perkins et al. '004 teach phthalocyanine precursors ,where the precursor contains more than 4 pthalonitrile units per molecule and has no tinctoral (coloring) qualities in itself, but which yield the corresponding colored phthalocyanine upon heating or treatment with reducing agents. (1/20-25). These decompose at 120 degrees C or less in the presence of a reducing agent, such as ascorbic acid (6/39-45).

Fleming et al. '704 teaches leuco phthalocyanine (phthalocyanine precursors) which are reacted with naphthoquinones and heated at 150 degrees C for three seconds to yield the corresponding Cu phthalocyanines (45/52-57) See also 32/48-33/12 which describes the use of reducing agents. The use of binders is also disclosed.

In addition to the basis above, it would have been obvious to modify the combination of RD 39219 and JP 58-008357, Fleming et al. '536 and Anderson et al. WO 03/032299 as set forth above by the use of other phthalocyanine precursors known to undergo thermal decomposition in the presence of reducing agents, such as ascorbic acid, such as those phthalocyanine precursors taught by Perkins et al. '004 or Fleming et al. '704 with a reasonable expectation of forming a useful photothermal recording layer.

There are no further comments beyond those addressed above as no further arguments were presented.

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**E)** Claims 1-10,12-22,24,25,33-36 and 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over RD 39219 and JP 58-008357, combined with Fleming et al. '536 and Anderson et al. WO 03/032299 and either Perkins et al. '004 or Fleming et al. '704, further in view of Gravsteijn et al. '811 and Melles Griot Catalog (1995/96) pp. 49-4 through 49-5.

Gravsteijn et al. '811 teach the use of 800 nm lasers with powers of 10 mW (8/24-36). The use of optical recording media with squarilium dyes with lasers in the 750-850 nm range and the formation of pits having 10 microns sizes is disclosed (4/40-68)

Melles Griot Catalog (1995/96) pp. 49-4 through 49-5 teaches diode lasers operating in the 750 and 780 nm range with powers of 1-180 mW output.

It would have been obvious to one skilled in the art to modify the teachings RD 39219, JP 58-008357, Fleming et al. '536 and Anderson et al. WO 03/032299, combined with either Perkins et al. '004 or Fleming et al. '704 as discussed above by using other wavelengths based upon the disclosure by Gravsteijn et al. '811 that the NIR squarilium dyes absorbs in the 750-800 nm range and to use commercially available lasers, such as those in the Melles Griot Catalog (1995/96) pp. 49-4 through 49-5 with higher powers to allow the writing of information in less time as exposure is power multiplied by time.

There are no further comments beyond those addressed above as no further arguments were presented.

#### **(10) Response to Argument**

As the discussed in the Appeal brief, the color forming composition recite two functional requirements (throughout brief, see for example page 17, first full paragraph). The first is that the

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composition is able to react to form the colored phthalocyanine dye from the precursor in less than about 1 msec. The second is that the composition is able to absorb sufficient light from a laser operating at 30-50 mW and focused to a spot size of 1-200 micrometers (microns) to facilitate the coloration in the recited period of time. As the claims under prosecution are not method claims, the examiner adopts the position that the exact process need not be shown in the references, but it must be clear from the rejection that the functional limitation are met.

In the paragraph bridging pages 16 and 17 of the Appeal Brief, the appellant correctly points out that the JP 58-008357 and RD 39219 references do not describe the time required for the color evolution or its use with a laser having the requisite spot size. The appellant argues that to achieve the recited sensitivity of the composition requires careful selection of the components and quantities thereof. The appellant also argues that the examiner has not accounted for the configuration of the elements to achieve the recited functionality (appeal brief at page 19). The appellant addresses the examiner's discussion of US 2772284 (cited in instant specification at page 10). The examiner had pointed out that the specific precursors discussed in the applicant's specification required heating at 200 degrees (see example 5). This is reduced to heating at 100 degrees by the addition of a reducing agent (ascorbic acid) as evidenced by example 6 of US 2772284. The applicant points out that the heating in US 2772284 is 15 minutes, which is much longer than the recited 1 msec (brief at page 20). The appellant argues that they are not claiming the compounds, but rather a composition which may include these (Appeal Brief at page 20). The appellant further argues that in view of the data in US 2772284, specifically the 15 minutes of heating, would weigh in favor of patentability of the claimed composition (Appeal Brief at page 20).

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The examiner has relied upon what is taught in the references applied to establish the inherent functionality. The JP 58-008357 and RD 39219 references do teach specific temperatures at which the composition can become colored. In the case of JP 58-008357, the temperature is 100-150 degrees C and in RD 39219 the temperature of 150 degrees is taught. The addition of the NIR absorber taught by RD 39219 allows for lasers to be used for the heating, but does not preclude the use of a thermal head for this heating (see Satake et al. 55/41-46). The examiner proposed (on page 7 of the final office action) that "If the applicant can show that the inventive compositions color at unexpectedly lower temperatures in declaration evidence and amends the claims to be commensurate with the showing (i.e. take the inventive composition and heat it with a calibrated thermal head, rather than using light) this could be considered as addressing the issue of sensitivity, which the applicant seems to be advancing as the benefit." as a means for evidencing unexpected results, but the appellant has not availed themselves of this offer. The position of inherent thermo-sensitivity is supported by the teachings of Satake et al. at (55/41-46). The sole example of the instant specification (pages 18-19 of the instant specification) combines the precursor with ~6.7 wt % of the IR dye. Therefore the thermal sensitivity of the composition should be similar to that of example 5 of US 2772284, specifically requiring heating at ~200 degrees C. Heating above this temperature would speed up the reaction as more energy would be available to thermally drive the reaction to form the colored phthalocyanine. The temperatures required by JP 58-008357 and RD 39219 are less than 200 degrees, which means that the reaction would be driven faster by this additional heating. The evidence in the record clearly shows that the compositions of the prior art are more thermally sensitive than that of the inventive example. This is due in part to the reducing agents which

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lower the temperature required for phthalocyanine dye formation. Both JP 58-008357 and RD 39219 include direction to reducing agents in the compositions. It is not clear at what point coloration happened in the examples of US 2772284 as the reference seems to heat for 15 minutes in the examples as a matter of course. It may be that the coloration occurred before the time was completed. On this basis the examiner holds that the compositions rendered obvious above, inherently are thermally sensitive enough to color within ~1 msec when heated using a laser or thermal head

With respect to the issue of "configured to", it is clear in both JP 58-008357 and RD 39219, the phthalocyanine precursors and reducing agents are mixed together to form the recording layers and so they are configured to react with each other. The RD 39219 teaches that "the NIR dye of this imaging medium can either be present in the same film layer ...phthalocyanine precursor compound ,or can be present in a separate layer that is adjacent to and in intimate contact with the layer containing the .... phthalocyanine compound precursor compound", so clearly in addition to the configuration of the phthalocyanine precursor and the reducing agent being configured to react to form the colored compound at the lower temperature, the NIR dye is taught in the prior art to be configured/located properly for the resultant composition to be photosensitized by the light to heat conversion properties of the NIR dye.

The appellant argues on page 19 that the examiner in pointing to (various) IR absorbers and the amount of ~4% does not establish the composition would have the requisite sensitivity to the laser. The examiner has previously pointed out that 4% is taught in Satake et al. and 0.5 to 15% is taught in Kawauchi. These weight percentages are at least partially within the 0.001 to 10% of the instant specification and higher than the preferred range of 0.5 to 1%. With respect



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to the spectral sensitivity, only claims 8, 24 and 33 recite a wavelength range and so the argument is not coextensive with the broadest claims. Further, the Satake et al. and Kawauchi each teach specific dyes, with Satake et al. teaching an 830 nm laser using with specific dyes. One skilled in the art would choose the dyes and laser so that the absorption of the dyes encompasses the laser emission wavelength, otherwise it would not be sensitive to that laser. The RD 39219 teaches that “the NIR dye of this imaging medium can either be present in the same film layer ...phthalocyanine precursor compound, or can be present in a separate layer that is adjacent to and in intimate contact with the layer containing the .... phthalocyanine compound precursor compound”, so clearly in addition to the configuration of the phthalocyanine precursor and the reducing agent being configured to react to form the colored compound at the lower temperature, the NIR dye is taught in the prior art to be configured/located properly for the resultant composition to be photosensitized by the light to heat conversion properties of the NIR dye. The applicant’s arguments fail to appreciate that the duration of the exposure is not recited in the claims. As the duration of the laser exposure is shortened the fluence (power density) is increased. A laser can very efficiently get the energy into the medium, but to dissipate the energy (cool) the medium takes time. With short exposure times (microseconds) and no means to rapidly cool the medium (i.e. a thermally conductive metal layer), heat is built up quickly. On this basis the examiner holds that the compositions rendered obvious above, inherently are thermally sensitive enough to color within ~1 msec when heated using a laser and that with ~4% of an IR absorber in intimate contact with the phthalocyanine precursor and reducing agent the media is inherently able to reach temperatures sufficiently high (above their threshold coloring

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temperature) to cause coloration within 1 msec upon exposure with 30-50 mW of laser light focused down to a spot size of 1-200 microns.

Pages 23-27 merely restate that the references applied do not teach each and every element of the claims.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Martin J Angebrannndt/  
Primary Examiner, Art Unit 1795

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Martin J. Angebrannndt, Primary Examiner  
April 2, 2009

Conferees:

/Thomas Dunn/

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Thomas Dunn, TQAS, TC1700

April 6, 2009

/Mark F. Huff/

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Mark F. Huff, SPE, Art Unit 1795

April 8, 2009